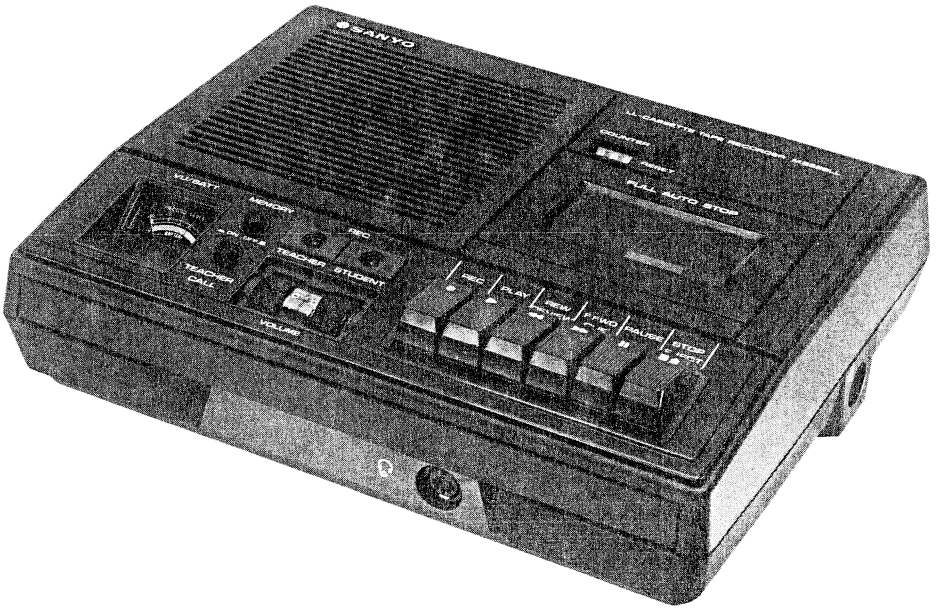
SERVICE MANUAL

SANYO

LL CASSETTE TAPE RECORDER

M2599LL

EUROPE



141 878 01

SPECIFICAITONS

Power Source	
AC	110V/220V, 24V (50/60Hz)
DC	9V
(UM-2, C Cell, Babyzellen, R 14, HP 11) x 6	
Output Power	1.5W (10% Dist.), 2.0W (Max.)
Power Consumption	8W
Current Consumption (at Vol. Min.)	
Record mode	300mA
Playback mode	190mA
Fast Forward mode	200mA
Rewind mode	200mA
Recording System	AC Bias
Erasing System	AC Erasing
Tape Speed	4.76cm/s ± 2%
Wow & Flutter	0.15% DIN WTD PLAY
Fast Forward Time	100sec. (with C-60)
Rewind Time	100sec. (with C-60)

Frequency Response (Overall, ± 3dB)	100Hz ~ 10,000Hz
Erase Ratio	65dB
Signal to Noise Ratio UNWTD/WTD	
Student Track	42dB/46dB
Teacher Track	48dB/50dB
Crosstalk	
Track to Track	50dB
Harmonic Distortion (K3)	1.5%
Hum & Noise (at Vol. Min.)	−33dBs
Input Sensitivity and Impedance	
MIC.	0.15mV/3.3kΩ
DIN INPUT	0.54μA/3.3kΩ
Output Level and Impedance	
DIN OUTPUT	316mV/1.5kΩ
Headphone	3.2V/22Ω
	1.3V (25Ω load)
Oscillation Frequency	45kHz

–Specifications subject to change without notice.–

WM -7744

NOTE:
The above mentioned specifications are mainly based on the IHF measurements standard. They can therefore not directly be compared with specifications based on the DIN standard or other standards.

MECHANICAL ADJUSTMENTS

GENERAL REMARKS

1. Before and after the mechanism adjustment, clean the tape contacting surfaces with a soft cloth soaked in alcohol.

2. The belts must be kept clean while the adjustments are performed.

3. Slicone grease (Example: SHIN-ETSU SILICONE KS-64) is applied to the Drive Belt and the Take-up Belt on the compact cassette side to protect them from abrasion.
   If necessary, apply a little amount of silicone grease to each groove of the Flywheel and Friction Assemblies.
   Then, rotate the motor, so that the grease flows into the belt.
   * If silicone grease other than the specified one or its equivalent is used, the melting of the belt may be caused.
   * Silicone grease is not applied to the Replacement Belts.
   * Grease or oil should not stick to the ASO belt. If the belt is stained with grease or oil, wipe it clean with benzine.

EQUPMENT REQUIRED

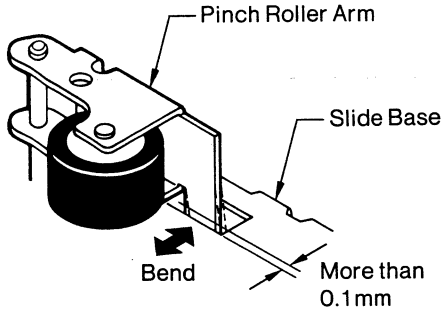
* Cassette-type Torquemeter
* Plus Screwdriver
* A Pair of Tweezers
* Paint or Glue

PINCH ROLLER ADJUSTMENT

1. While slowly pressing the PLAY button , check to see that the Take-up Reel rotates before the Pinch Roller starts rotating.

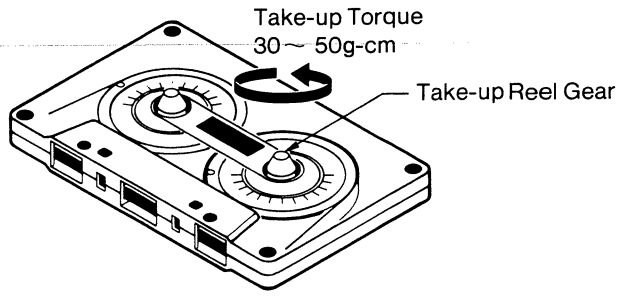
2. Set the unit in the playback mode and check to see that the clearance between the Pinch Roller Arm and the Slide Base is more than 0.1mm.

3. If necessary, adjust the clearance by bending the Pinch Roller Arm as illustrated.
   Do not excessively bend it.
   * If the Pinch Roller has a defective rubber surface, replace it with a new one.



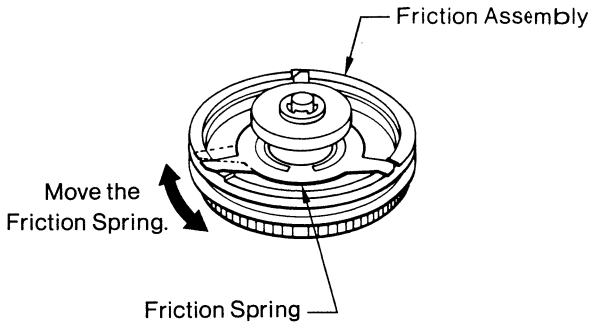
TAKE-UP TORQUE ADJUSTMENT

1. Insert a cassette-type torquemeter into the unit and measure the torque of the Take-up Reel Gear with the unit in the play-back mode. It should be 30 ~ 50g-cm.



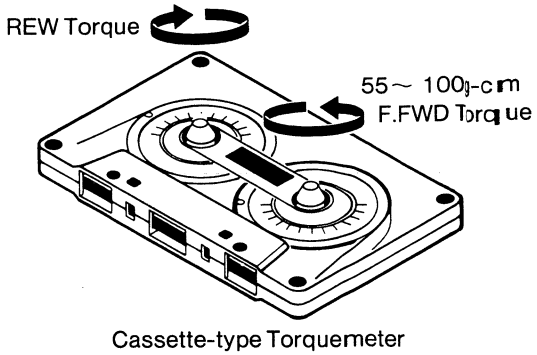
Cassette-type Torquemeter

2. If necessary, adjust the torque by moving the Friction Spring of the Friction Assembly as illustrated.



FAST FORWARD & REWIND TORQUES

1. The fast forward and rewind torque values measured by a cassette-type torquemeter should be 55 ~ 100g-cm.



Cassette-type Torquemeter

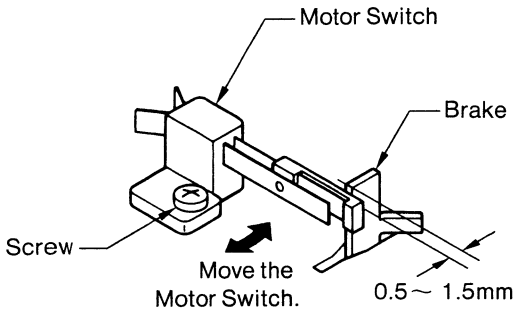
2. If the torque value is more than 100g-cm, apply a proper amount of silicone grease (Example: SHIN-ETSU SILICONE KS-64) to the groove of the Friction Assembly. Then, rotate the motor, so that the grease flows into the Take-up Belt.

3. If the torque value is less than 55g-cm, replace the Take-up Belt with a new one.

MECHANICAL ADJUSTMENTS (Continued)

MOTOR SWITCH ADJUSTMENT

1. Set the unit in the stop mode and check to see that the clearance between the Motor Switch and the Brake is 0.5 ~ 1.5mm as illustrated, and that the Motor Switch is turned on by pressing one of the Select Buttons (PLAY, F.FWD, or REW).
2. If necessary, loosen the screw fastening the Motor Switch and move the Switch to the specified position.
3. After the adjustment, tighten the screw and secure it with paint or glue.



ELECTRICAL ADJUSTMENTS

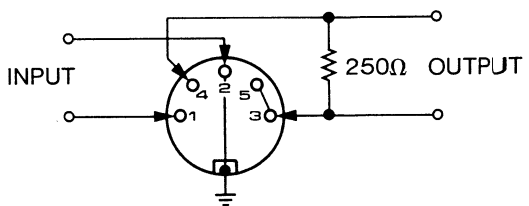
EQUIPMENT REQUIRED

- Audio Signal Generator
- Frequecy Counter
- VTVM
- Dummy Loads (250Ω and 470kΩ)
- DC Constant-Voltage Regulator
- AC Constant-Voltage Regulator
- Test Tapes
  - * 3kHz Test Tape (Example: TEAC MTT-111) for Tape Speed Adjustment
  - * 6.3kHz Test Tape (Example: TEAC MTT-113) for Head Azimuth Adjustment
  - * 1kHz Test Tape (Example: TEAC MTT-118) for Playback Gain Adjustment
  - * Normal Tape (Example: TDK AC-212) for recording and playback operations

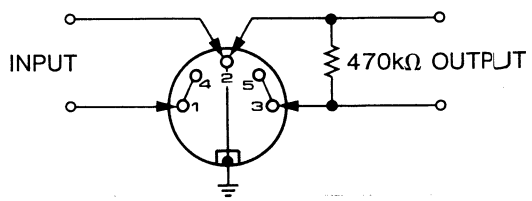
NOTE:

1. The Electrical Adjustments should be performed in the order as described below.
2. Supply 9V DC from a constant-voltage regulator to the battery terminals of the unit whenever a repair or an adjustment work is performed.
3. Unless otherwise specified, set the Volume Controls to the Maximum.
4. When connecting the terminals of the DIN jack, connect the leads noting the terminal numbers as illustrated.

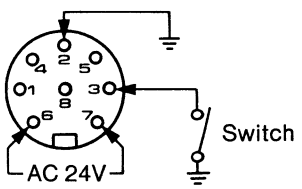
[Head Set Jack]



[REC/PLAY Jack]



[LL Remote Jack]

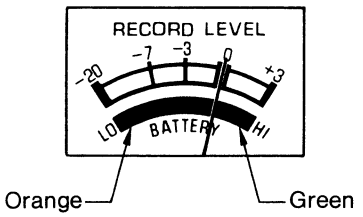


ELECTRICAL ADJUSTMENTS (Continued)

BATTERY LEVEL ADJUSTMENT

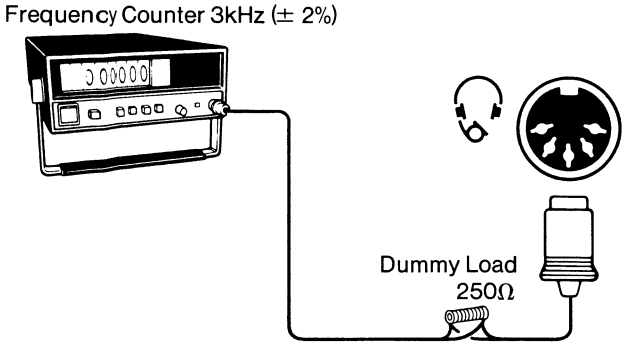
1. Supply 6.8V DC from a constant-voltage regulator to the battery terminals of the unit.

2. Minimize the Volume Controls with the unit in the playback mode and adjust the potentiometer (P4) until the pointer of the Meter stays over the border between the orange and green zones as illustrated.



TAPE SPEED ADJUSTMENT

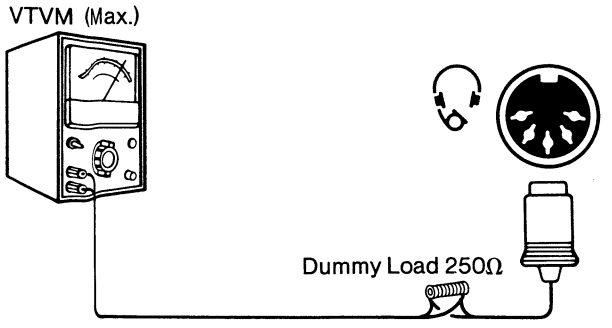
1. Remove the cassette compartment lid from the unit and connect a frequency counter to the output terminals of the Head Set jack as illustrated. Then, insert a 3kHz test tape (Example: TEAC MTT-111) into the cassette compartment.



2. While playing back the test tape, adjust the tape speed by turning the potentiometer connected to the Motor with an alignment tool until the frequency counter reads 3kHz (± 2%).

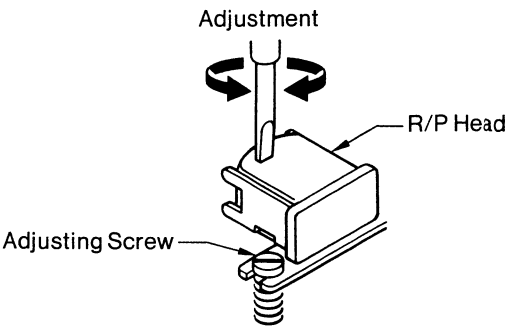
HEAD AZIMUTH ADJUSTMENT

1. Open the cassette compartment lid and remove the Head Cover from the unit. Then, connect a VTVM to the output of the Head Set jack as illustrated.



2. Insert a 6.3kHz test tape (Example: TEAC MTT-113) into the cassette compartment and set the volume control on the Student side to the minimum and the volume control on the Teacher side to the maximum.

3. While playing back the test tape, slowly turn the azimuth adjusting screw until the VTVM reads the maximum.

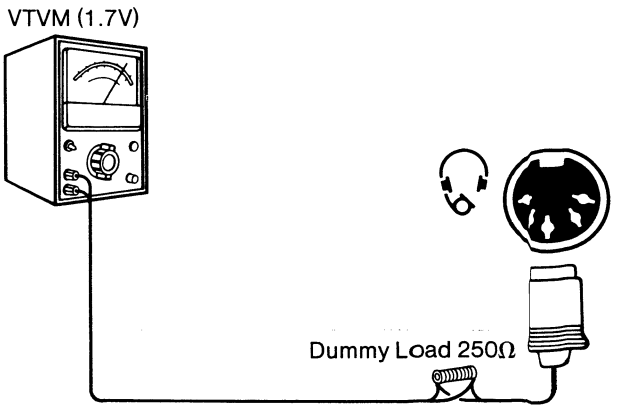


4. After the adjustment, secure the adjusting screw with paint or glue.

PLAYBACK GAIN ADJUSTMENT

Teacher Channel Gain Adjustment

1. Connect a VTVM to the output terminals of the Head Set jack as illustrated and insert a 1kHz test tape (Example: TEAC MTT-118) into the cassette compartment.



2. Set the volume control on the Student side to the minimum and the volume control on the Teacher side to the maximum. While playing back the test tape, adjust the potentiometer (P201) until the VTVM reads 1.7V.

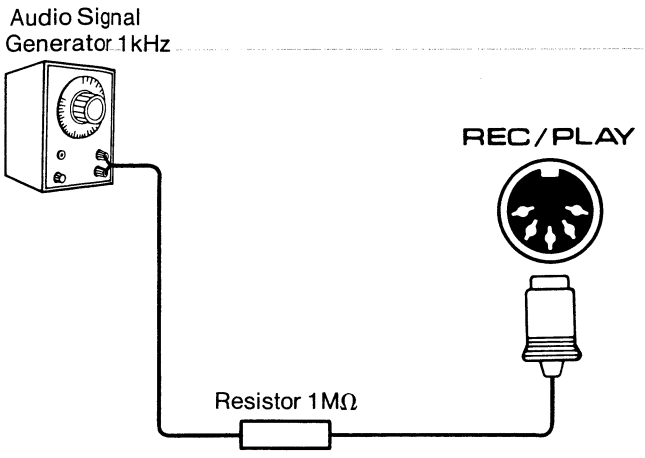
Student Channel Gain Adjustment

3. Set the volume control on the Student side to the maximum and the volume control on the Teacher side to the minimum. While playing back the test tape, adjust the potentiometer (P101) until the VTVM reads 1.7V.

ELECTRICAL ADJUSTMENTS (Continued)

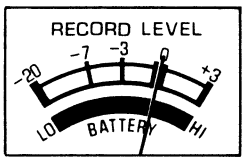
INPUT SENSITIVITY ADJUSTMENT

1. Connect an audio signal generator through an 1MΩ resistor to the input termianls of the REC/PALY jack as illustrated and insert a cassette tape (Example: TDK AC-212) into the cassette compartment.



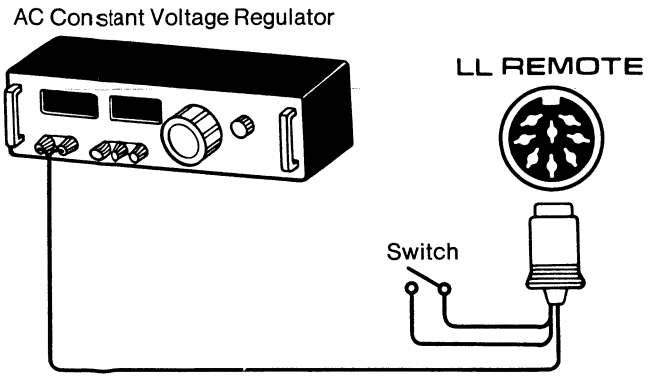
2. Feed a 1kHz signal from the audio signal generator at 0.3mV to the unit and set the unit in the recording mode.

3. Adjust the potentiometer (P203) until the pointer of the Meter swings to 0VU on the meter scale.

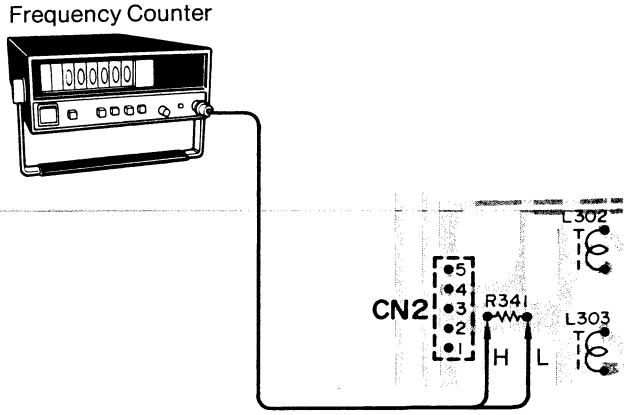


OSCILLATION FREQUENCY ADJUSTMENT

1. Connect an AC constant-voltage regulator and the switch to the LL Remote jack as illustrated.



2. Connect a frequency counter across the resistor R341 (1Ω) on the Amplifier P.C.Board as illustrated and supply 24V AC from AC regulator to the unit.



3. Set the unit in the recording mode and turn on the switch. Then, keep in mind the oscillation frequency on the frequency counter.

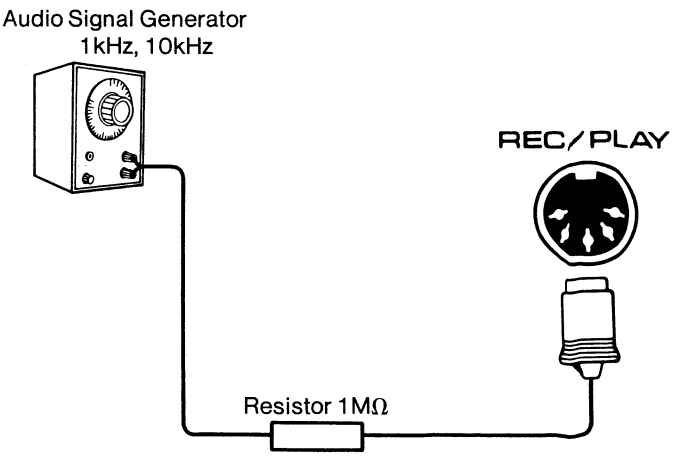
4. After turning off the switch, adjust the core of Coil L203 until the oscillation frequency approaches as equal the frequency in Item 3 as possible.

5. Connect the 5P DIN plug to the REC/PLAY jack and adjust the core of the Coil L103 until the oscillation frequency approaches as equal the frequency in Item 3 as possible.

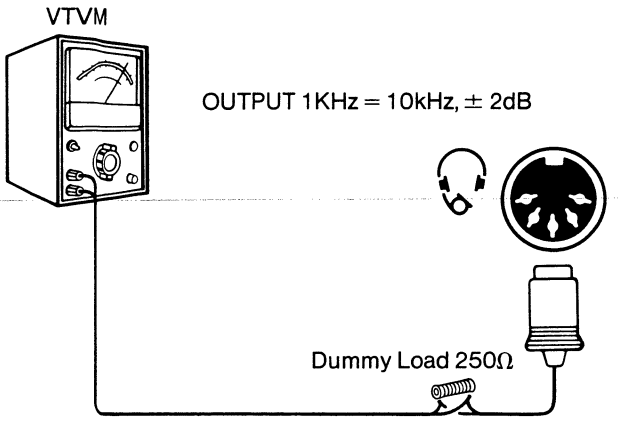
RECORD & PLAYBACK FREQUENCY RESPONSE ADJUSTMENT

Teacher Channel

1. Connect an audio signal generator through an 1MΩ resistor to the input terminals of the REC/PLAY jack, and a VTVM to the output of terminals of the Head Set jack as illustrated.



ELECTRICAL ADJUSTMENTS (Continued)



2. Insert a cassette tape (Example: TDK AC-212) into the cassette compartment and alternately record the 1kHz and 10kHz signals from the audio signal generator at 54mV on the tape several times.

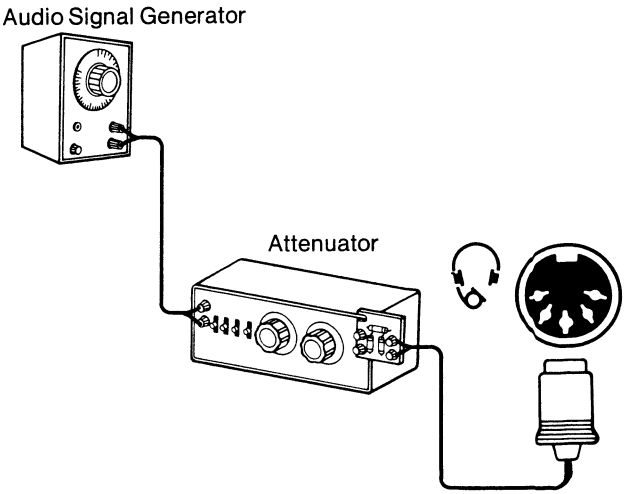
3. While playing back the recorded signals, check that the 10kHz signal output is identical to the 1kHz signal output or the deviation is ± 2dB on the VTVM.

4. If necessary, adjust the output by turning the potentiometer (P302) and re-check the output of each signal by playing back the signals after the recording operation of the signals.

5. Repeat the above adjustment until the specified output is obtained.

Student Channel

6. Disconnect the 5P plug from the REC/PLAY jack and connect the audio signal generator and the attenuator to the input terminals of the Head Set jack as illustrated. The audio input level has to be 0.015mV.



7. Perform the same adjustment with the potentiometer P301 as described in Item 2 through 5 until the specified output is obtained.

PARTS LIST

PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A COMPONENT REPLACEMENT IS MADE IN ANY AREA OF AN UNIT. COMPONENTS INDICATED BY A MARK ⚠ IN THIS PARTS LIST AND THE SCHEMATIC DIAGRAM SHOW COMPONENTS WHOSE VALUE HAS SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS SPECIFIED ON THE FOLLOWING PARTS LIST BE USED FOR COMPONENT REPLACEMENT POINTED OUT BY THE MARK.

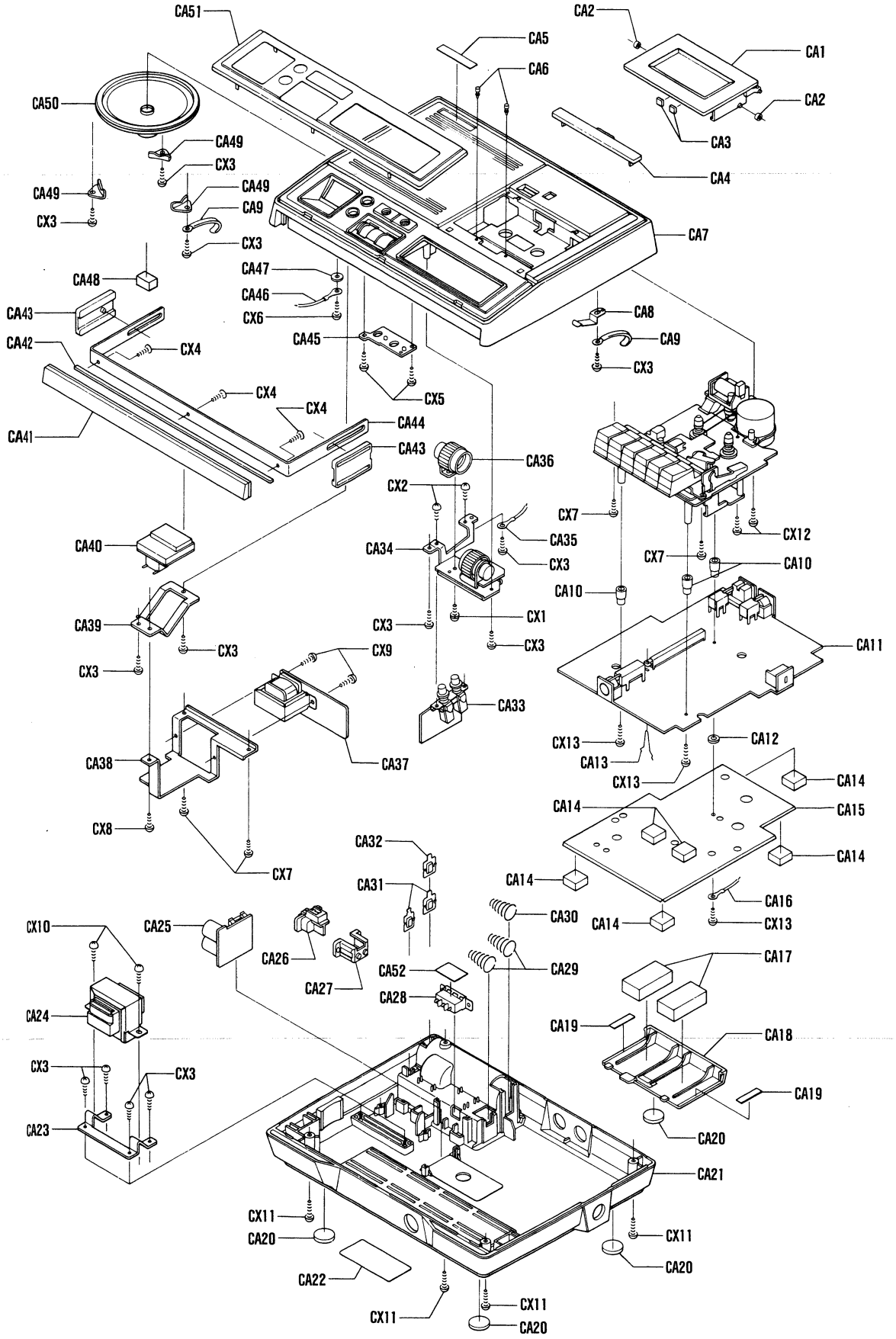
Ref. No.	Part No.	Description	Q'ty
	PACKAGE		
	141 6 1419 39001	Individual Carton	1
	141 6 1449 54400	Styrofoam Case	1
	141 6 1449 54500	Styrofoam Case	1
	141 6 2519 08020	Poly Cover 80 x 200	1
	141 6 2519 08390	Poly Cover	1
	141 6 3319 11400	Spacer	1
	141 6 4559 00100	Serial No. Sheet	3
	ACCESSORIES		
	4 1529 70121	Headphone	1
	4 2419 71264	Cassette Tape	1
	⚠ 4 2439 70310	Power Cord	1
	141 6 4729 07700	Caution Label	1
	142 6 4119 30300	Instruction Book	1
	CABINET		
	4 2359 74472	Connector 1P Assy (CN7)	1
C346	CD1 0 7160 0001V	Electrolytic 100μF 16V	1
C347	CD1 0 7160 0001V	Electrolytic 100μF 16V	1
CA1	141 2 1249 18900	Cassette Lid	1
CA2	141 2 4619 06400	Tube	2
CA3	141 2 4469 27200	Cushion	2
CA4	141 2 1339 19701	Head Cover	1
CA5	141 2 1429 08100	Badge	1
CA6	141 2 4469 26600	Cushion	2
CA7	141 0 1119 58101	Completed Cabinet Top	1
CA8	141 2 8539 23201	Spring, Cassette Lid	1
CA9	141 2 4729 04100	Lug	1
CA10	141 2 3779 15000	Post, PCB	3
CA11	4 1329 74101	Amplifier P.C.B. Assy [**See PCB1**]	1
CA12	141 2 4579 02501	Washer	1
CA13	141 2 8529 03401	Spring, Record	1
CA14	141 2 4469 02300	Cushion, Indicator	6
CA15	141 2 3229 24701	Shield Plate	1
CA16	4 2379 70680	Terminal Wire Assy	1
CA17	141 2 4469 20500	Cushion, Battery Lid	2
CA18	141 2 1339 19800	Battery Lid	1
CA19	141 2 4419 12000	Cushion	2
CA20	141 2 1749 03600	Foot, Cabinet	4
CA21	141 0 1119 56701	Cabinet Bottom Assy	1
CA22	141 2 1419 04513	Rating Plate	1

Ref. No.	Part No.	Description	Q'ty
CA23	141 2 3719 04300	Trans Bracket	1
CA24	⚠ 4 2519 71831	Power Trans [T301]	1
CA25	4 2269 37050	Power Supply P.C.B. Assy [**See PCB4**]	1
CA26	⚠ 4 2359 72800	AC Socket	1
CA27	141 2 4359 14404	Socket Cover	1
CA28	⚠ 4 2319 72130	Switch Slide (Voltage Select) [S15]	1
CA29	141 2 3829 21300	Spring, Battery	2
CA30	141 2 3829 06800	Spring, BAT Terminal	1
CA31	141 2 3829 20300	Terminal BAT, Anode	2
CA32	141 2 3829 09400	Terminal BAT, Anode	1
CA33	4 2319 73531	Switch P.C.B. Assy [**See PCB3**]	1
CA34	4 2229 71881	Student Volume P.C.B. Assy [**See PCB5**]	1
CA35	4 2379 70682	Terminal Wire Assy	1
CA36	4 2229 71891	Teacher Volume P.C.B. Assy [**See PCB6**]	1
CA37	4 2269 37040	LL Power Supply P.C.B. Assy [**See PCB2**]	1
CA38	141 2 3719 05900	Bracket, Trans	1
CA39	141 2 3739 04301	Bracket, Indicator	1
CA40	4 5119 70411	Meter (VU/Battery) [ME1]	1
CA41	141 2 1719 18800	Handle Pad	1
CA42	141 2 2719 11100	Handle Plate	1
CA43	141 2 2719 11000	Handle Holder	2
CA44	141 2 1719 18900	Handle	1
CA45	4 2269 30591	LED P.C.B. Assy [**See PCB7**]	1
CA46	4 2379 70681	Terminal Wire Assy	1
CA47	141 2 4569 05500	Washer	1
CA48	141 2 4469 41800	Cushion	1
CA49	141 2 3729 00800	Fix Bracket, Speaker	3
CA50	4 1519 70420	Speaker (4Ω) [SP1]	1
CA51	141 2 1449 40601	Name Plate	1
CA52	141 2 4359 31800	Insulator	1
CX1	131 3 1302 60411	Screw, Pan Hd. C SW +M2.6x4	1
CX2	131 3 1303 00411	Screw, Pan Hd. C SW +M3.0x4	2
CX3	143 3 1303 00811	Screw, Pan Hd. Tapping-B +M3.0x8	13
CX4	103 3 1202 60614	Screw, Flat Hd. Tapping-2 +M2.6x6	3
CX5	143 3 1303 00511	Screw, Pan Hd. Tapping-B +M3.0x5	2
CX6	143 3 1303 00611	Screw, Pan Hd. Tapping-B +M3.0x6	1
CX7	143 3 1303 01411	Screw, Pan Hd. Tapping-B +M3.0x14	4
CX8	101 3 1303 00411	Screw, Pan Hd. +M3.0x4	1
CX9	131 3 1303 00611	Screw, Pan Hd. C SW +M3.0x6	2
CX10	103 3 1303 00511	Screw, Pan Hd. Tapping-2 +M3.0x5	2
CX11	143 3 1303 01211	Screw, Pan Hd. Tapping-B +M3.0x12	4
CX12	143 3 1303 01011	Screw, Pan Hd. Tapping-B +M3.0x10	2
CX13	143 3 1303 02011	Screw, Pan Hd. Tapping-B +M3.0x20	3

NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

CABINET EXPLODED VIEW



MECHANISM PARTS LIST

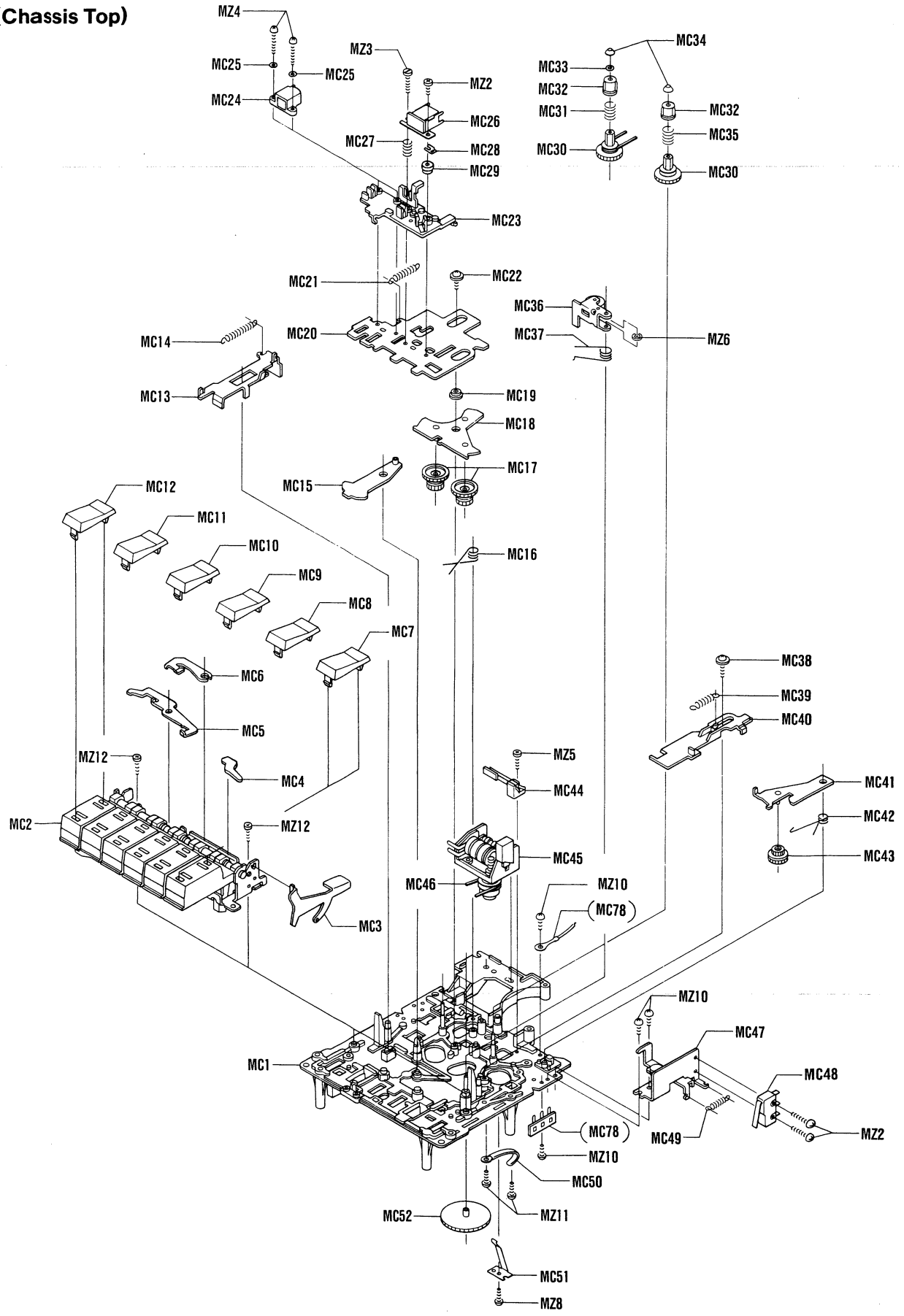
Ref. No.	Part No.	Description	Q'ty
	MECHANISM		
	4 2359 75197	Connector 8P Assy [CN4]	1
	4 2359 75544	Connector 6P Assy [CN1]	1
	4 2359 75565	Connector 4P Assy [CN5]	1
	4 2359 75661	Connector 5P Assy [CN2]	1
MC1	141 0 3119 14502	Chassis Assy	1
MC2	141 0 1619 26001	Select Button Assy	1
MC3	141 2 7419 50400	Eject Lever	1
MC4	141 2 7419 48200	Pause Lever	1
MC5	141 2 7419 50900	Cue Lever	1
MC6	141 2 7419 51000	Review Lever	1
MC7	141 2 1539 10309	Cap, Stop Button	1
MC8	141 2 1539 10310	Cap, Puase Button	1
MC9	141 2 1539 10306	Cap, FF Button	1
MC10	141 2 1539 10307	Cap, REW Button	1
MC11	141 2 1539 10308	Cap, Play Button	1
MC12	141 2 1539 10300	Cap, Button	1
MC13	141 2 7319 32201	Plate, Slide Base	1
MC14	141 2 8519 70400	Spring, Slide Base Plate	1
MC15	141 2 7419 48100	Fast Wind Lever	1
MC16	141 2 8519 67100	Spring, Fast Wind	1
MC17	141 2 5519 22300	Fast Wind Gear	2
MC18	141 0 7439 05400	Fast Wind Arm Assy	1
MC19	141 2 3529 19101	Spacer, Base	1
MC20	141 2 7319 31100	Plate	1
MC21	141 2 8519 70200	Spring, Slide Base	1
MC22	141 2 4219 12100	Screw w/Washer	2
MC23	141 2 3529 17800	Spacer, Head	1
MC24	4 2429 71441	Erase Head [HD2]	1
MC25	141 2 4539 10500	Washer	2
MC26	4 2429 72170	R/P Head [HD1]	1
MC27	141 2 8519 47400	Spring, Head	1
MC28	141 2 3529 18101	Spacer, Head	1
MC29	141 2 3769 08300	Post, R/P Head	1
MC30	141 2 5319 05100	Reel Gear	2
MC31	141 2 8519 67901	Spring, Supply Reel	1
MC32	141 2 5319 03500	Reel Fin	2
MC33	141 2 4539 27100	Washer	1
MC34	141 2 5369 00400	Cap, Reel Plate	2
MC35	141 2 8519 67900	Spring, Reel	1
MC36	141 0 5419 02300	Pinch Roller Assy	1
MC37	141 2 8519 67700	Spring, Pinch Roller	1
MC38	141 2 4219 05400	Screw w/Washer	2
MC39	141 2 8519 70300	Spring, Pause Plate	1
MC40	141 2 7319 31200	Pause Plate	1
MC41	141 0 7439 05500	Take-up Arm Assy	1
MC42	141 2 8519 67300	Spring, Take-up Arm	1
MC43	141 2 5519 22000	Take-up Gear	1
MC44	4 2319 72010	Leaf Switch (Motor) [S6]	1
MC45	141 2 8119 06102	Counter	1
MC46	141 2 5649 10500	Counter Belt	1
MC47	141 0 3659 01600	Bracket, SW R Assy	1
MC48	4 2319 70512	Micro Switch (Student Interlock) [S13]	1
MC49	141 2 8519 92700	Spring, Head Base	1
MC50	141 2 4729 04100	Lug	1
MC51	141 2 8539 30000	Spring, Cassette	1
MC52	141 2 5519 22400	Rewind Gear	1
MC53	4 2319 70511	Micro Switch (Rewind) [S9]	1
MC54	141 2 4729 04000	Lug	1
MC55	141 2 7319 31300	Lock Plate	1
MC56	141 2 7419 50200	Stop Lever	1
MC57	141 2 3529 17900	Spacer, Brake	1
MC58	141 2 8519 19300	Spring, Brake	1
MC59	141 2 7419 50500	Stop Eject Lever	1
MC60	141 2 8519 68100	Spring, Pause	1
MC61	141 2 5649 09900	Take-up Belt	1
MC62	141 0 5519 05901	Friction Assy	1
MC63	141 2 4539 15800	Washer	2
MC64	141 2 7419 42900	ASO Lever	1
MC65	141 2 8519 67800	Spring, ASO	1
MC66	141 2 4539 14800	Washer	1
MC67	141 2 5649 12300	Belt ASO	1
MC68	141 2 5519 22500	Pulley ASO	1
MC69	141 2 4459 20500	Brake Cover	2
MC70	141 2 7149 03401	Brake	1
MC71	141 2 8519 03600	Spring, Shut Off Lever	1
MC72	141 2 5649 10000	Drive Belt	1
MC73	141 0 5219 03900	Flywheel Assy	1
MC74	141 0 3519 13100	Support Assy	1
MC75	141 2 8519 25100	Spring, Interlock Lever	1
MC76	141 2 8539 01700	Spring, Interlock Lever	1
MC77	141 2 4219 12900	Screw w/Washer	2
MC78	4 5279 70920	Motor [M1]	1
MC79	141 2 8429 05500	Record Plate	1
MC80	141 2 8519 74500	Spring, Record Plate	1
MC81	4 2319 72774	Leaf Switch (Motor Timing) [S7]	3
MC81	4 2319 72774	Leaf Switch (Motor Stop) [S8]	3
MC81	4 2319 72774	Leaf Switch (Muting) [S14]	3
MC82	141 2 3659 18000	Switch Bracket	1
MC83	141 0 3659 01500	Bracket, SW L Assy	1
MC84	4 2319 70512	Micro Switch (Teacher Interlock) [S12]	1
MC85	141 2 8519 92600	Spring Base Head	1
MC86	141 2 4539 06700	Washer	1
MZ1	110 3 9200 70034	Nylon Washer M2.0x7.0x0.3	1
MZ2	101 3 1302 00811	Screw, Pan Hd. +M2.0x8	5
MZ3	101 3 2502 01011	Screw, Cyllinder Hd. -M2.0x10	1
MZ4	101 3 1702 01011	Screw, Bind Hd. +M2.0x10	2
MZ5	104 3 1702 00611	Screw, Bind Hd. Tapping-3 +M2.0x6	1
MZ6	112 3 1302 00082	E Ring M2.0	1
MZ7	103 3 1302 01211	Screw, Pan Hd. Tapping-2 +M2.0x12	1
MZ8	143 3 1302 60611	Screw, Pan Hd. Tapping-B +M2.6x6	1
MZ9	143 3 1303 01611	Screw, Pan Hd. Tapping-B +M3.0x16	2
MZ10	103 3 1302 60511	Screw, Pan Hd. Tapping-2 +M2.6x5	9
MZ11	101 3 1303 00611	Screw, Pan Hd. +M3.0x6	2
MZ12	103 3 1702 60811	Screw, Bind Hd. Tapping-2 +M2.6x8	2

NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

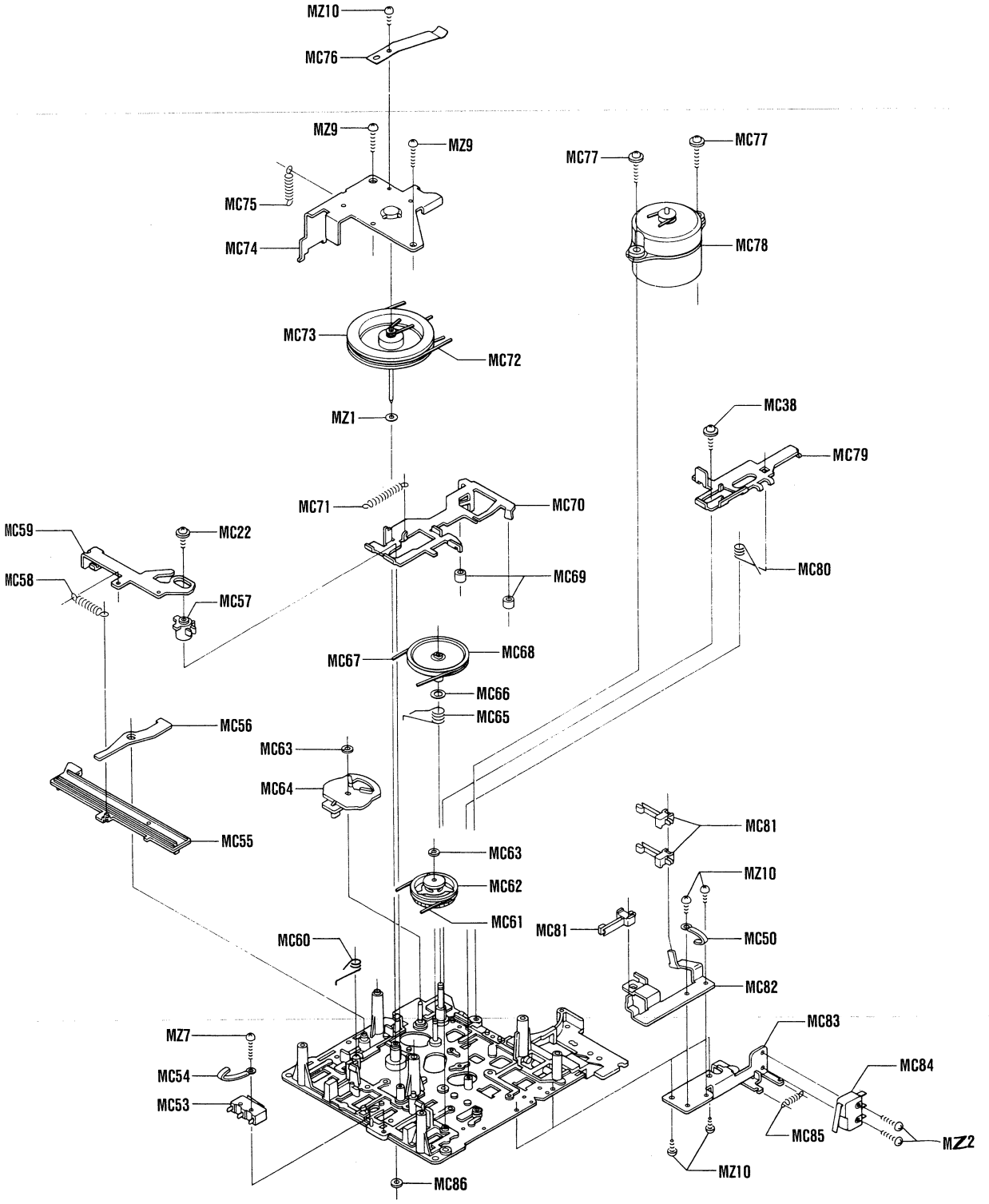
MECHANISM EXPLODED VIEW

(Chassis Top)



MECHANISM EXPLODED VIEW (Continued)

(Chassis Bottom)



P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description	Q'ty
	AMPLIFIER P.C.B. ASSY		
PCB1	4 1329 74101	Amplifier P.C.B. Assy	1
	141 2 4729 05000	Staple, 5mm	23
	141 2 4729 04700	Staple, 10mm	52
CN1	4 2369 71452	Connector 6P	1
CN2	4 2369 72920	Connector 5P	1
CN3	4 2369 71651	Connector 13P	1
CN4	4 2369 71881	Connector 8P	1
CN5	4 2369 71851	Connector 4P	1
CN6	4 2369 71452	Connector 6P	1
CN7	4 2369 70740	Pin RT	1
CN8	4 2369 70740	Pin RT	1
J1	4 2359 71552	DIN Socket 5P (Record/Play)	1
J2	4 2359 71552	DIN Socket 5P (Head Set)	1
J3	4 2359 73090	DIN Socket 2P (Ext. Speaker)	1
J4	4 2359 74850	DIN Socket 8P (LL Remote)	1
RE1	4 2329 70190	Relay	1
RE2	4 2329 70190	Relay	1
S1	4 2319 71800	Slide Switch (Record/Play)	1
S2	4 2319 73001	Slide Switch (LL Remote, DIN)	1
S3	4 2319 71900	Slide Switch (Record/Play, DIN)	1
S4	4 2319 73001	Slide Switch (Head Set, DIN)	1
S5	4 2319 73130	Leaf Switch (AMP Power)	1
T201	4 2559 70160	Step-up Trans	1
T303	4 2589 71392	OSC Trans	1
L101	4 2559 70150	Coil (3.9mH)	1
L102	4 2539 70610	Coil (33mH)	1
L103	4 2559 70140	Coil	1
L201	4 2559 70150	Coil (3.9mH)	1
L202	4 2539 70610	Coil (33mH)	1
L203	4 2559 70140	Coil	1
L301	4 2559 70170	Coil (5,6mH)	1
P101	4 2229 72969	Potentiometer (B-30kΩ)	1
P201	4 2229 72969	Potentiometer (B-30kΩ)	1
P202	4 2229 72966	Potentiometer (B-5kΩ)	1
P203	4 2229 72971	Potentiometer (B-100kΩ)	1
P301	4 2229 72973	Potentiometer (B-300kΩ)	1
P302	4 2229 72973	Potentiometer (B-300kΩ)	1
D101	202 5 9110 18820	Diode, 1S 188	1
D102	4 2029 71440	Diode, 1SS95	1
D103	4 2029 71440	Diode, 1SS95	1
D104	4 2029 71440	Diode, 1SS95	1
D201	4 2029 71440	Diode, 1SS95	1
D202	4 2029 71440	Diode, 1SS95	1
D203	4 2029 71440	Diode, 1SS95	1
D204	4 2029 71440	Diode, 1SS95	1
D205	4 2029 70910	Diode, RD3.3EB	1
D206	4 2029 71440	Diode, 1SS95	1
D207	4 2029 71440	Diode, 1SS95	1
D208	202 5 9110 18820	Diode, 1S 188	1
D209	202 5 9110 18820	Diode, 1S 188	1
D210	202 5 9110 18820	Diode, 1S 188	1
D211	4 2029 71440	Diode, 1SS95	1
D212	4 2029 71440	Diode, 1SS95	1
D301	4 2029 71440	Diode, 1SS95	1
D302	4 2029 71440	Diode, 1SS95	1
D303	4 2029 71440	Diode, 1SS95	1
D304	202 5 2470 13540	Diode, DS135	1
D306	202 5 2470 13540	Diode, DS135	1
D310	202 5 3210 05610	Diode, GZA5.6L	1
Q101	203 5 5000 53650	Transistor, 2SC 536	1
Q102	203 5 5000 53650	Transistor, 2SC 536	1
Q201	203 5 5210 53650	Transistor, 2SC 536	1
Q202	203 5 5000 53650	Transistor, 2SC 536	1
Q203	203 5 5000 53650	Transistor, 2SC 536	1
Q204	203 5 5000 53650	Transistor, 2SC 536	1
Q205	4 2039 70950	Transistor, 2SC2878	1
Q206	4 2039 70950	Transistor, 2SC2878	1
Q207	4 2039 70950	Transistor, 2SC2878	1
Q208	203 5 7200 60850	Transistor, 2SA 608	1
Q209	203 5 5000 53650	Transistor, 2SC536	1
Q301	4 2039 70430	Transistor, 2SC 1815	1
Q302	4 2039 70430	Transistor, 2SC 1815	1
Q303	203 5 5000 53650	Transistor, 2SC 536	1
Q304	203 5 7200 60850	Transistor, 2SA 608	1
Q305	203 5 7200 60850	Transistor, 2SA 608	1
Q306	203 5 4580 69850	Transistor, 2SB698	1
Q307	203 5 5000 53650	Transistor, 2SC 536	1
Q308	203 5 4580 69850	Transistor, 2SB698	1
Q309	203 5 5000 53650	Transistor, 2SC 536	1
Q310	203 5 6940 54550	Transistor, 2SD 545	1
IC101	4 2069 70071	IC, TA7137P	1
IC102	4 2069 70141	IC, TA7140P	1
IC103	4 2069 70071	IC, TA7137P	1
IC201	4 2069 70071	IC, TA7137P	1
IC202	4 2069 70141	IC, TA7140P	1
IC203	4 2069 70071	IC, TA7137P	1
IC301	206 5 0844 11210	IC, LA 4112	1
C101	CD1 0 6100 0001V	Electrolytic 10μF 10V	1
C102	CD1 0 7100 0001V	Electrolytic 100μF 10V	1
C103	CC1 0 2500 KE00C	Ceramic 0.001μF 50V ± 10%	1
C104	CC3 3 0500 KD00C	Ceramic 33pF 50V ± 10%	1
C105	CD4 7 6100 0001V	Electrolytic 47μF 10V	1
C106	CD1 0 6100 0001V	Electrolytic 10μF 10V	1
C107	CC1 5 1500 KE00C	Ceramic 150pF 50V ± 10%	1
C108	CD2 2 7100 0001V	Electrolytic 220μF 10V	1
C109	CD4 7 5250 0001V	Electrolytic 4.7μF 25V	1
C110	CD1 0 7100 0001V	Electrolytic 100μF 10V	1
C111	CC1 0 2500 KE00C	Ceramic 0.001μF 50V ± 10%	1
C112	CD1 0 7100 0001V	Electrolytic 100μF 10V	1
C113	CC3 3 0500 KD00C	Ceramic 33pF 50V ± 10%	1
C114	CD1 0 7100 0001V	Electrolytic 100μF 10V	1
C115	CI1 8 3250 KF00C	Boundary 0.018μF 25V ± 10%	1
C116	CD4 7 5250 0001V	Electrolytic 4.7μF 25V	1
C117	CD1 0 6100 0001V	Electrolytic 10μF 10V	1
C118	CD1 0 7100 0001V	Electrolytic 100μF 10V	1
C119	CC1 0 2500 KE00C	Ceramic 0.001μF 50V ± 10%	1
C120	CD1 0 6100 0001V	Electrolytic 10μF 10V	1
C121	CD4 7 5100 0001V	Electrolytic 4.7μF 10V	1
C122	CD4 7 7100 0001V	Electrolytic 470μF 10V	1
C123	CC1 0 2500 KE00C	Ceramic 0.001μF 50V ± 10%	1
C124	CD1 0 6100 0001V	Electrolytic 10μF 10V	1
C125	CC3 3 2500 KE00C	Ceramic 0.0033μF 50V ± 10%	1
C126	CD4 7 6100 0001V	Electrolytic 47μF 10V	1
C127	CM5 6 3500 K00SV	Mylar 0.056μF 50V ± 10%	1
C128	CD1 0 6100 0001V	Electrolytic 10μF 10V	1
C129	CD1 0 5500 0001V	Electrolytic 1μF 50V	1
C130	CC5 6 2500 KE00C	Ceramic 0.0056μF 50V ± 10%	1
C131	CC3 3 1500 KE00C	Ceramic 330pF 50V ± 10%	1
C132	CD4 7 6100 0001V	Electrolytic 47μF 10V	1
C133	CD4 7 5100 0001V	Electrolytic 4.7μF 10V	1
C134	CD1 0 6100 0001V	Electrolytic 10μF 10V	1
C135	CC1 0 2500 KE00C	Ceramic 0.001μF 50V ± 10%	1
C136	CC3 9 0500 KE00C	Ceramic 39pF 50V ± 10%	1
C137	CC3 9 0500 KE00C	Ceramic 39pF 50V ± 10%	1
C138	CC3 3 2500 KE00C	Ceramic 0.0033μF 50V ± 10%	1
C201	CD1 0 6100 0001V	Electrolytic 10μF 10V	1
C202	CD1 0 7100 0001V	Electrolytic 100μF 10V	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description			Q'ty
C203	CC1 0 2500 KE00C	Ceramic	0.001μF	50V ± 10%	1
C204	CC1 5 1500 KE00C	Ceramic	150pF	50V ± 10%	1
C205	CD4 7 6100 0001V	Electrolytic	47μF	10V	1
C206	CC1 5 1500 KE00C	Ceramic	150pF	50V ± 10%	1
C207	CD1 0 6100 0001V	Electrolytic	10μF	10V	1
C208	CD1 0 7100 0001V	Electrolytic	100μF	10V	1
C209	CD1 0 5100 0001V	Electrolytic	1μF	10V	1
C210	CD4 7 5250 0001V	Electrolytic	4.7μF	25V	1
C211	CC3 3 1500 KE00C	Ceramic	330pF	50V ± 10%	1
C212	CC1 0 1500 KE00C	Ceramic	100pF	50V ± 10%	1
C213	CD1 0 7100 0001V	Electrolytic	100μF	10V	1
C214	CC3 3 0500 KD00C	Ceramic	33pF	50V ± 10%	1
C215	CD4 7 6100 0001V	Electrolytic	47μF	10V	1
C216	CI1 8 3250 KF00C	Boundary	0.018μF	25V ± 10%	1
C217	CD4 7 5250 0002V	Electrolytic	4.7μF	25V	1
C218	CD1 0 7100 0001V	Electrolytic	100μF	10V	1
C219	CD1 0 6160 0002V	Electrolytic	10μF	16V	1
C220	4 2239 70510	Capacitor	470μF	6.3V	1
C221	CC1 0 2500 KE00C	Ceramic	0.001μF	50V ± 10%	1
C222	CD1 0 7100 0001V	Electrolytic	100μF	10V	1
C223	CD1 0 6100 0001V	Electrolytic	10μF	10V	1
C224	CD1 0 7100 0001V	Electrolytic	100μF	10V	1
C225	CD4 7 5250 0001V	Electrolytic	4.7μF	25V	1
C226	CD4 7 7100 0001V	Electrolytic	470μF	10V	1
C227	CC1 0 2500 KE00C	Ceramic	0.001μF	50V ± 10%	1
C228	CD1 0 6100 0001V	Electrolytic	10μF	10V	1
C229	CD4 7 6100 0002V	Electrolytic	47μF	10V	1
C230	CC3 3 2500 KE00C	Ceramic	0.0033μF	50V ± 10%	1
C231	4 2239 70510	Capacitor	470μF	6.3V	1
C232	CM5 6 3500 K00SV	Mylar	0.056μF	50V ± 10%	1
C233	CD1 0 5500 0001V	Electrolytic	1μF	50V	1
C234	CC3 9 1500 KE00C	Ceramic	390pF	50V ± 10%	1
C235	CD4 7 6100 0001V	Electrolytic	47μF	10V	1
C236	CD4 7 5100 0001V	Electrolytic	4.7μF	10V	1
C237	CC1 0 2500 KE00C	Ceramic	0.001μF	50V ± 10%	1
C238	CD1 0 6100 0001V	Electrolytic	10μF	10V	1
C239	CD4 7 5250 0002V	Electrolytic	4.7μF	25V	1
C240	CD4 7 5250 0002V	Electrolytic	4.7μF	25V	1
C241	CC3 3 2500 KE00C	Ceramic	0.0033μF	50V ± 10%	1
C242	CC3 9 0500 KE00C	Ceramic	39pF	50V ± 10%	1
C243	CC3 9 0500 KE00C	Ceramic	39pF	50V ± 10%	1
C244	CD1 0 6100 0001V	Electrolytic	10μF	10V	1
C245	CI1 2 3250 KF00C	Boundary	0.012μF	25V ± 10%	1
C246	CD1 0 6100 0001V	Electrolytic	10μF	10V	1
C301	CM2 2 3500 K00SV	Mylar	0.022μF	50V ± 10%	1
C302	CM4 7 2500 K00SV	Mylar	0.0047μF	50V ± 10%	1
C303	CM6 8 2500 K00SV	Mylar	0.0068μF	50V ± 10%	1
C304	CM6 8 2500 K00SV	Mylar	0.0068μF	50V ± 10%	1
C305	CD1 0 7100 0001V	Electrolytic	100μF	10V	1
C306	CS1 5 2500 J000V	Polystyroul	0.0015μF	50V ± 5%	1
C307	CC3 3 1500 KE00C	Ceramic	330pF	50V ± 10%	1
C308	CC3 3 1500 KE00C	Ceramic	330pF	50V ± 10%	1
C309	CD4 7 7100 0001V	Electrolytic	470μF	10V	1
C310	CS2 0 2500 J000V	Polystyroul	0.002μF	50V ± 5%	1
C311	CD1 0 5500 0001V	Electrolytic	1μF	50V	1
C312	CC2 2 2500 KE00C	Ceramic	0.0022μF	50V ± 10%	1
C313	CD2 2 6100 0001V	Electrolytic	22μF	10V	1
C314	CD4 7 6100 0001V	Electrolytic	47μF	10V	1
C315	CC3 3 1500 KE00C	Ceramic	330pF	50V ± 10%	1
C316	CD2 2 7100 0001V	Electrolytic	220μF	10V	1
C317	CD2 2 7100 0001V	Electrolytic	220μF	10V	1
C318	CD2 2 7100 0001V	Electrolytic	220μF	10V	1
C319	CM2 2 4500 K00SV	Mylar	0.22μF	50V ± 10%	1
C320	CD1 0 6100 0001V	Electrolytic	10μF	10V	1

Ref. No.	Part No.	Description			Q'ty
C321	CD1 0 863A 0001V	Electrolytic	1000μF	6.3V	1
C322	CD2 2 8160 0001V	Electrolytic	2200μF	16V	1
C323	CD3 3 7160 0001V	Electrolytic	330μF	16V	1
C324	CD1 0 5100 0001V	Electrolytic	1μF	10V	1
C325	CD1 0 7160 0001V	Electrolytic	100μF	16V	1
C326	CD3 3 7160 0001V	Electrolytic	330μF	16V	1
C327	CB4 7 5100 0000V	None-polar	4.7μF	10V	1
C328	CB4 7 5100 0000V	None-polar	4.7μF	10V	1
C329	CD1 0 7100 0001V	Electrolytic	100μF	10V	1
C330	4 2239 70830	Capacitor	333μF	16V	1
C331	CC8 2 2500 KE00C	Ceramic	0.0082μF	50V ± 10%	1
C332	CC2 2 2500 KE00C	Ceramic	0.0022μF	50V ± 10%	1
R101	RP3 3 2121 JH000	Pretty Carbon	3.3kΩ	1/8W ± 5%	1
R102	RP5 6 3121 JH000	Pretty Carbon	56kΩ	1/8W ± 5%	1
R103	RP1 2 3121 JH000	Pretty Carbon	12kΩ	1/8W ± 5%	1
R104	RP3 3 3121 JH000	Pretty Carbon	33kΩ	1/8W ± 5%	1
R105	RP3 3 3121 JH000	Pretty Carbon	33kΩ	1/8W ± 5%	1
R106	RP4 7 2121 JH000	Pretty Carbon	4.7kΩ	1/8W ± 5%	1
R107	RP3 9 2121 JH000	Pretty Carbon	3.9kΩ	1/8W ± 5%	1
R108	RP1 0 5121 JH000	Pretty Carbon	1MΩ	1/8W ± 5%	1
R109	RP5 6 3121 JH000	Pretty Carbon	56kΩ	1/8W ± 5%	1
R110	RP1 2 3121 JH000	Pretty Carbon	12kΩ	1/8W ± 5%	1
R111	RP6 8 2121 JH000	Pretty Carbon	6.8kΩ	1/8W ± 5%	1
R112	RP1 8 4121 JH000	Pretty Carbon	180kΩ	1/8W ± 5%	1
R113	RD8 2 1251 JM000	Carbon	820Ω	1/4W ± 5%	1
R114	RP3 3 1121 JH000	Pretty Carbon	330Ω	1/8W ± 5%	1
R115	RP2 7 2121 JH000	Pretty Carbon	2.7kΩ	1/8W ± 5%	1
R116	RP2 7 4121 JH000	Pretty Carbon	270kΩ	1/8W ± 5%	1
R117	RP4 7 0121 JH000	Pretty Carbon	47Ω	1/8W ± 5%	1
R118	RP2 2 2121 JH000	Pretty Carbon	2.2kΩ	1/8W ± 5%	1
R119	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W ± 5%	1
R120	RP3 3 1121 JH000	Pretty Carbon	330Ω	1/8W ± 5%	1
R121	RP5 6 0121 JH000	Pretty Carbon	56Ω	1/8W ± 5%	1
R122	RD1 5 1251 JM000	Carbon	150Ω	1/4W ± 5%	1
R123	RP1 0 3121 JH000	Pretty Carbon	10kΩ	1/8W ± 5%	1
R124	RP6 8 0121 JH000	Pretty Carbon	68Ω	1/8W ± 5%	1
R125	RP6 8 2121 JH000	Pretty Carbon	6.8kΩ	1/8W ± 5%	1
R126	RD1 8 5251 JN000	Carbon	1.8MΩ	1/4W ± 5%	1
R127	RP8 2 3121 JH000	Pretty Carbon	82kΩ	1/8W ± 5%	1
R128	RP1 2 2121 JH000	Pretty Carbon	1.2kΩ	1/8W ± 5%	1
R129	RP2 2 0121 JH000	Pretty Carbon	22Ω	1/8W ± 5%	1
R130	RP1 5 2121 JH000	Pretty Carbon	1.5kΩ	1/8W ± 5%	1
R131	RD2 7 3251 JM000	Carbon	27kΩ	1/4W ± 5%	1
R132	RP1 0 0121 JH000	Pretty Carbon	10Ω	1/8W ± 5%	1
R133	RP6 8 2121 JH000	Pretty Carbon	6.8kΩ	1/8W ± 5%	1
R201	RP3 3 2121 JH000	Pretty Carbon	3.3kΩ	1/8W ± 5%	1
R202	RP4 7 4121 JH000	Pretty Carbon	470kΩ	1/8W ± 5%	1
R203	RP5 6 3121 JH000	Pretty Carbon	56kΩ	1/8W ± 5%	1
R204	RP1 2 3121 JH000	Pretty Carbon	12kΩ	1/8W ± 5%	1
R205	RP1 2 3121 JH000	Pretty Carbon	12kΩ	1/8W ± 5%	1
R206	RP8 2 1121 JH000	Pretty Carbon	820Ω	1/8W ± 5%	1
R207	RP1 5 3121 JH000	Pretty Carbon	15kΩ	1/8W ± 5%	1
R208	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W ± 5%	1
R209	RP1 0 4121 JH000	Pretty Carbon	100kΩ	1/8W ± 5%	1
R210	RP4 7 2121 JH000	Pretty Carbon	4.7kΩ	1/8W ± 5%	1
R211	RP4 7 2121 JH000	Pretty Carbon	4.7kΩ	1/8W ± 5%	1
R212	RP4 7 2121 JH000	Pretty Carbon	4.7kΩ	1/8W ± 5%	1
R213	RP1 0 5121 JH000	Pretty Carbon	1MΩ	1/8W ± 5%	1
R214	RP5 6 3121 JH000	Pretty Carbon	56kΩ	1/8W ± 5%	1
R215	RP1 2 3121 JH000	Pretty Carbon	12kΩ	1/8W ± 5%	1
R216	RP6 8 2121 JH000	Pretty Carbon	6.8kΩ	1/8W ± 5%	1
R217	RP1 8 4121 JH000	Pretty Carbon	180kΩ	1/8W ± 5%	1
R218	RP6 8 2121 JH000	Pretty Carbon	6.8kΩ	1/8W ± 5%	1
R219	RP2 7 2121 JH000	Pretty Carbon	2.7kΩ	1/8W ± 5%	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description				Q'ty
R220	RP5 6 2121 JH000	Pretty Carbon	5.6kΩ	1/8W	± 5%	1
R221	RD1 5 3251 JM000	Carbon	15kΩ	1/4W	± 5%	1
R222	RP1 8 3121 JH000	Pretty Carbon	18kΩ	1/8W	± 5%	1
R223	RP2 2 2121 JH000	Pretty Carbon	2.2kΩ	1/8W	± 5%	1
R224	RP4 7 1121 JH000	Pretty Carbon	470Ω	1/8W	± 5%	1
R225	RP3 3 1121 JH000	Pretty Carbon	330Ω	1/8W	± 5%	1
R226	RP2 7 4121 JH000	Pretty Carbon	270kΩ	1/8W	± 5%	1
R227	RP2 7 2121 JH000	Pretty Carbon	2.7kΩ	1/8W	± 5%	1
R228	RP4 7 0121 JH000	Pretty Carbon	47Ω	1/8W	± 5%	1
R229	RP6 8 2121 JH000	Pretty Carbon	6.8kΩ	1/8W	± 5%	1
R230	RP1 5 1121 JH000	Pretty Carbon	150Ω	1/8W	± 5%	1
R231	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W	± 5%	1
R232	RP1 8 1121 JH000	Pretty Carbon	180Ω	1/8W	± 5%	1
R233	RD1 5 1251 JM000	Carbon	150Ω	1/4W	± 5%	1
R234	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W	± 5%	1
R235	RP6 8 0121 JH000	Pretty Carbon	68Ω	1/8W	± 5%	1
R236	RP6 8 0121 JH000	Pretty Carbon	68Ω	1/8W	± 5%	1
R237	RP8 2 3121 JH000	Pretty Carbon	82kΩ	1/8W	± 5%	1
R238	RP9 1 3121 JH000	Pretty Carbon	91kΩ	1/8W	± 5%	1
R239	RD6 8 2251 JM000	Carbon	6.8kΩ	1/4W	± 5%	1
R240	RD1 8 5251 JN000	Carbon	1.8MΩ	1/4W	± 5%	1
R241	RP8 2 3121 JH000	Pretty Carbon	82kΩ	1/8W	± 5%	1
R242	RP1 2 2121 JH000	Pretty Carbon	1.2kΩ	1/8W	± 5%	1
R243	RP2 2 0121 JH000	Pretty Carbon	22Ω	1/8W	± 5%	1
R244	RP1 5 2121 JH000	Pretty Carbon	1.5kΩ	1/8W	± 5%	1
R245	RP1 5 2121 JH000	Pretty Carbon	1.5kΩ	1/8W	± 5%	1
R246	RP1 5 2121 JH000	Pretty Carbon	1.5kΩ	1/8W	± 5%	1
R247	RP6 8 3121 JH000	Pretty Carbon	68kΩ	1/8W	± 5%	1
R248	RP6 8 3121 JH000	Pretty Carbon	68kΩ	1/8W	± 5%	1
R249	RP3 3 2121 JH000	Pretty Carbon	3.3kΩ	1/8W	± 5%	1
R250	RP1 5 3121 JH000	Pretty Carbon	15kΩ	1/8W	± 5%	1
R251	RP5 6 0121 JH000	Pretty Carbon	56Ω	1/8W	± 5%	1
R252	RP1 0 0121 JH000	Pretty Carbon	10Ω	1/8W	± 5%	1
R253	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W	± 5%	1
R254	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W	± 5%	1
R255	RD1 5 3251 JM000	Carbon	15kΩ	1/4W	± 5%	1
R301	RP1 0 3121 JH000	Pretty Carbon	10kΩ	1/8W	± 5%	1
R302	RP1 0 3121 JH000	Pretty Carbon	10kΩ	1/8W	± 5%	1
R303	RP5 6 A121 JH000	Pretty Carbon	5.6Ω	1/8W	± 5%	1
R304	RP5 6 A121 JH000	Pretty Carbon	5.6Ω	1/8W	± 5%	1
R305	RP1 5 3121 JH000	Pretty Carbon	15kΩ	1/8W	± 5%	1
R306	RP5 6 3121 JH000	Pretty Carbon	56kΩ	1/8W	± 5%	1
R307	RP1 5 3121 JH000	Pretty Carbon	15kΩ	1/8W	± 5%	1
R308	RP8 2 3121 JH000	Pretty Carbon	82kΩ	1/8W	± 5%	1
R309	RP2 2 A121 JH000	Pretty Carbon	2.2Ω	1/8W	± 5%	1
R310	RP1 5 2121 JH000	Pretty Carbon	1.5kΩ	1/8W	± 5%	1
R311	RD1 5 1251 JM000	Carbon	150Ω	1/4W	± 5%	1
R312	RP3 3 2121 JH000	Pretty Carbon	3.3kΩ	1/8W	± 5%	1
R313	RP1 8 2121 JH000	Pretty Carbon	1.8kΩ	1/8W	± 5%	1
R314	RP2 7 0121 JH000	Pretty Carbon	27Ω	1/8W	± 5%	1
R315	RP2 2 2121 JH000	Pretty Carbon	2.2kΩ	1/8W	± 5%	1
R316	RP5 6 0121 JH000	Pretty Carbon	56Ω	1/8W	± 5%	1
R317	RP3 3 2121 JH000	Pretty Carbon	3.3kΩ	1/8W	± 5%	1
R318	RP1 0 3121 JH000	Pretty Carbon	10kΩ	1/8W	± 5%	1
R319	RP6 8 2121 JH000	Pretty Carbon	6.8kΩ	1/8W	± 5%	1
R320	RP1 0 2121 JH000	Pretty Carbon	1kΩ	1/8W	± 5%	1
R321	RD2 7 1251 JM000	Carbon	270Ω	1/4W	± 5%	1
R322	RP4 7 1121 JH000	Pretty Carbon	470Ω	1/8W	± 5%	1
R323	RP8 2 3121 JH000	Pretty Carbon	82kΩ	1/8W	± 5%	1
R324	RP8 2 3121 JH000	Pretty Carbon	82kΩ	1/8W	± 5%	1
R325	RP1 0 2121 JH000	Pretty Carbon	1kΩ	1/8W	± 5%	1
R326	RP1 0 1121 JH000	Pretty Carbon	100Ω	1/8W	± 5%	1
R327	RP6 8 2121 JH000	Pretty Carbon	6.8kΩ	1/8W	± 5%	1
R328	RP1 0 2121 JH000	Pretty Carbon	1kΩ	1/8W	± 5%	1
R329	RD5 6 0251 JM000	Carbon	56Ω	1/4W	± 5%	1
R330	RP1 0 3121 JH000	Pretty Carbon	10kΩ	1/8W	± 5%	1
R331	RD2 2 0251 JM000	Carbon	22Ω	1/4W	± 5%	1
R332	RP1 2 2121 JH000	Pretty Carbon	1.2kΩ	1/8W	± 5%	1
R333	RP2 7 0121 JH000	Pretty Carbon	27Ω	1/8W	± 5%	1
R334	RP3 3 3121 JH000	Pretty Carbon	33kΩ	1/8W	± 5%	1
R335	RP1 2 2121 JH000	Pretty Carbon	1.2kΩ	1/8W	± 5%	1
R336	RP5 6 0121 JH000	Pretty Carbon	56Ω	1/8W	± 5%	1
R338	RP2 2 2121 JH000	Pretty Carbon	2.2kΩ	1/8W	± 5%	1
R339	RP2 2 1121 JH000	Pretty Carbon	220Ω	1/8W	± 5%	1
R340	RP1 0 2121 JH000	Pretty Carbon	1kΩ	1/8W	± 5%	1
R341	RP1 0 A121 JH000	Pretty Carbon	1Ω	1/8W	± 5%	1
R342	RP6 8 2121 JH000	Pretty Carbon	6.8kΩ	1/8W	± 5%	1

LL POWER SUPPLY P.C.B. ASSY

PCB2	4 2269 37040	LL Power Supply P.C.B. Assy				1
	141 2 4729 04700	Staple 10				1
	⚠ 4 2359 70910	Fuse Holder				2
CN6	4 2359 75545	Connector 6P Assy				1
F302	⚠ 4 2349 70040	Fuse (500mA)				1
T302	⚠ 4 2519 73650	Power Trans				1
D310	202 5 2300 01810	Diode, DS 18				1
D311	202 5 2300 01710	Diode, DS 17				1
C339	CC2 2 3500 KE00C	Ceramic	0.022μF	50V	±10%	1
C340	CC2 2 3500 KE00C	Ceramic	0.022μF	50V	±10%	1
C341	CC2 2 3500 KE00C	Ceramic	0.022μF	50V	±10%	1
C342	CC2 2 3500 KE00C	Ceramic	0.022μF	50V	±10%	1
C343	CD2 2 8160 0001V	Electrolytic	2200μF	16V		1
C344	CD2 2 8160 0001V	Electrolytic	2200μF	16V		1
C345	CD2 2 8160 0001V	Electrolytic	2200μF	16V		1

SWITCH P.C.B. ASSY

PCB3	4 2319 73531	Switch P.C.B. Assy				1
	4 2269 30541	PCB, Switch				1
	141 2 1619 53300	Switch Knob				1
	141 2 1619 53300	Switch Knob				1
CN3	4 2359 75233	Connector 13P Assy				1
S10	4 2319 73140	Select Switch (Memory, Teacher Call)				1

POWER SUPPLY P.C.B. ASSY

PCB4	4 2269 37050	Power Supply P.C.B. Assy				1
	⚠ 4 2359 70910	Fuse Holder				2
CN8	4 2359 74471	Connector 1P Assy				1
F301	⚠ 4 2349 70040	Fuse (500mA)				1
D309	202 5 2300 01710	Diode, DS 17				1
D308	202 5 2300 01810	Diode, DS 18				1
C333	CC2 2 3500 KE00C	Ceramic	0.022μF	50V	±10%	1
C334	CC2 2 3500 KE00C	Ceramic	0.022μF	50V	±10%	1
C335	CC2 2 3500 KE00C	Ceramic	0.022μF	50V	±10%	1
C336	CC2 2 3500 KE00C	Ceramic	0.022μF	50V	±10%	1
C337	CD2 2 8160 0001V	Electrolytic	2200μF	16V		1
C338	CD2 2 8160 0001V	Electrolytic	2200μF	16V		1

STUDENT VOLUME P.C.B. ASSY

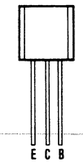
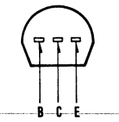
PCB5	4 2229 71881	Student Volume P.C.B. Assy				1
	4 2269 30561	PCB, Student Volume				1
	141 2 1619 53102	Volume Knob				1
	141 2 3619 10700	Volume Bracket				1
	101 3 1702 00611	Screw, Bind Hd.			+M2.0x6	1

P.C.BOARD PARTS LIST (Continued)

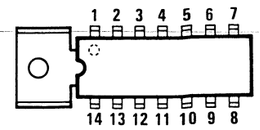
Ref. No.	Part No.	Description		Q'ty
	110 3 3202 00012	Ext. Star Washer	M2.0	1
VR101	4 2229 71162	Volume Control (C-10kΩ)		1
	TEACHER VOLUME P.C.B. ASSY			
PCB6	4 2229 71891	Teacher Volume P.C.B. Assy		1
	4 2269 30551	PCB, Teacher Volume		1
	141 2 1619 53103	Volume Knob		1
	141 2 3619 10600	Volume Bracket		1
	101 3 1702 00611	Screw, Bind Hd.	+M2.0x6	1
	110 3 3202 00012	Ext. Star Washer	M2.0	1
VR201	4 2229 71161	Volume Control (A-10kΩ)		1
	LED P.C.B. ASSY			
PCB7	4 2269 30591	LED P.C.B. Assy		1
	4 2269 30581	PCB, LED		1
D305	202 5 9150 02412	LED, SLP24BT (Student Record)		1
D307	202 5 9150 02412	LED, SLP24BT (Teacher Record)		1

NOTES:
1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

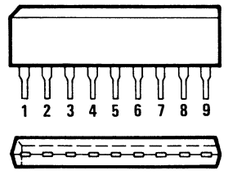
IC & TRANSISTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SA608 2SB698 2SC536 2SC1815 2SD545		
TERMINAL NAME		
B→ BASE C→ COLLECTOR E→ EMITTER		

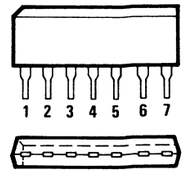
LA4112 BOTTM VIEW



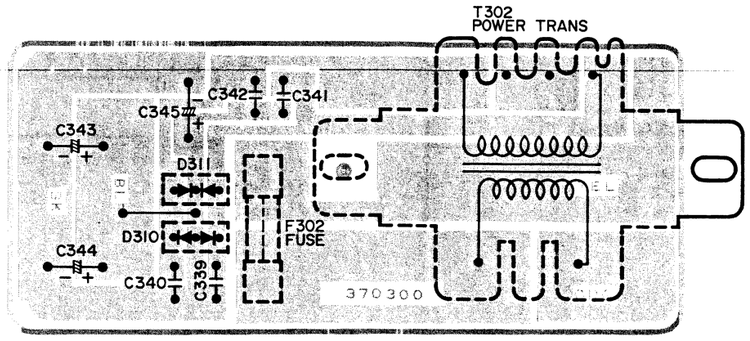
TA7137P FRONT/BOTTOM VIEW



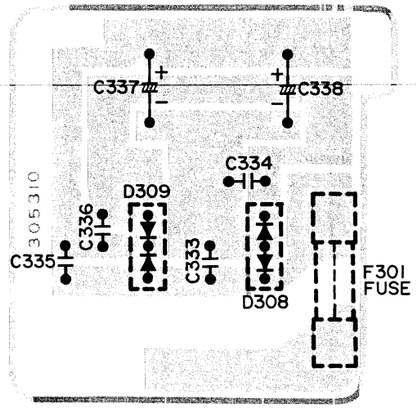
TA7140P FRONT/BOTTOM VIEW



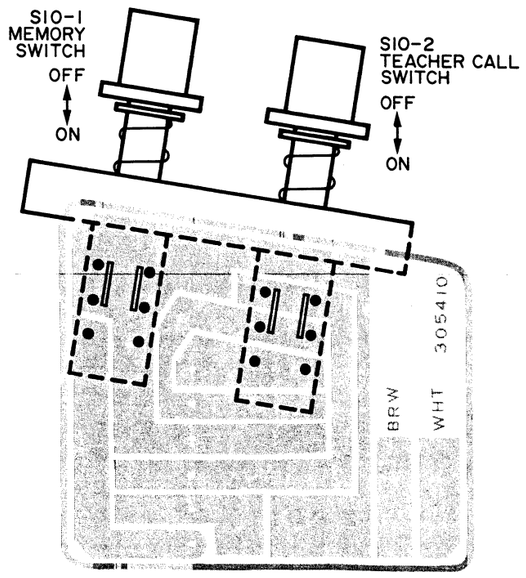
LL POWER SUPPLY P.C.BOARD



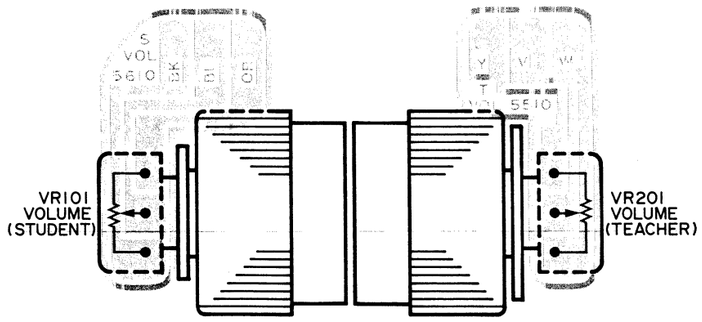
POWER SUPPLY P.C.BOARD



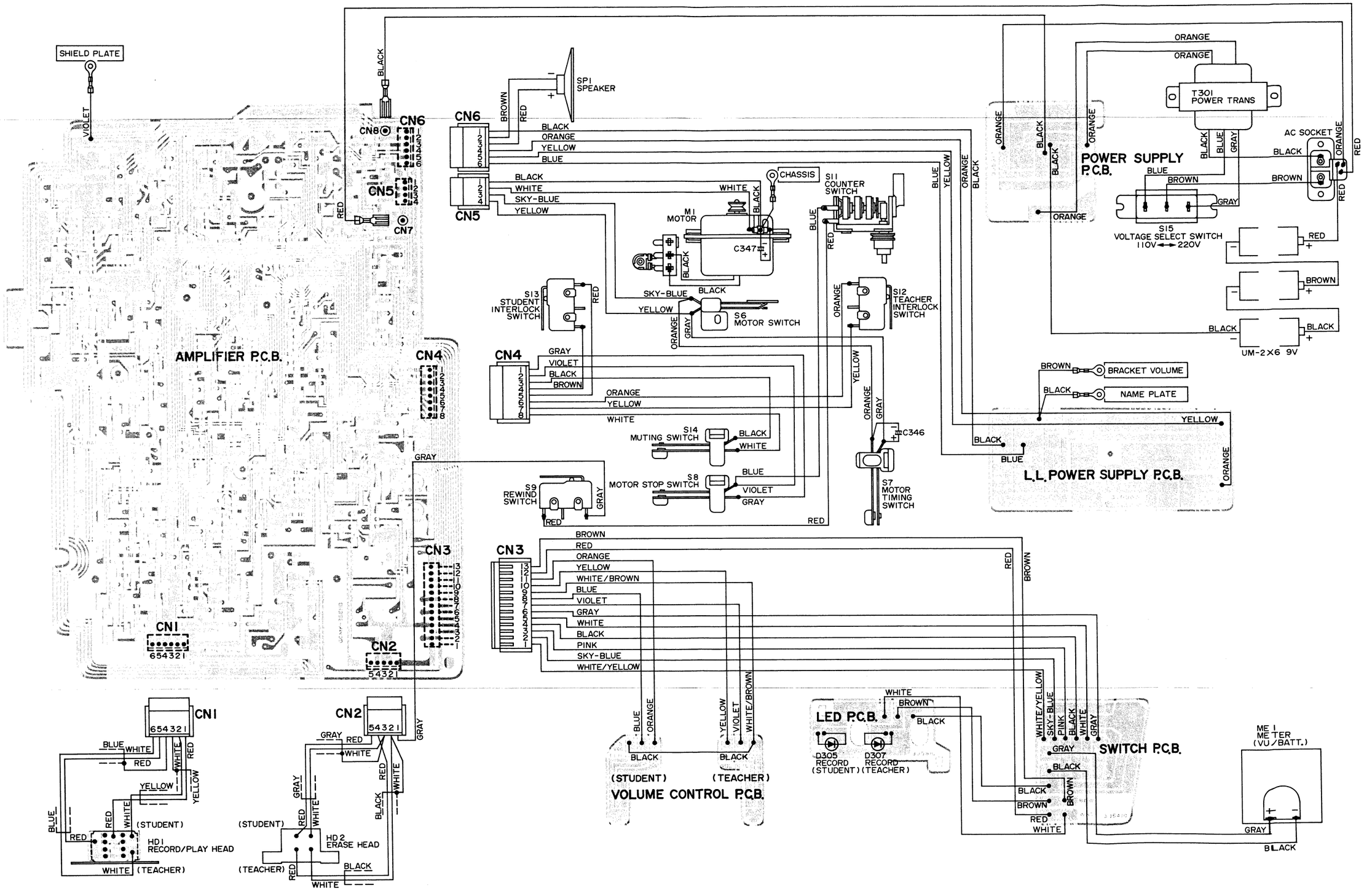
SWITCH P.C.BOARD



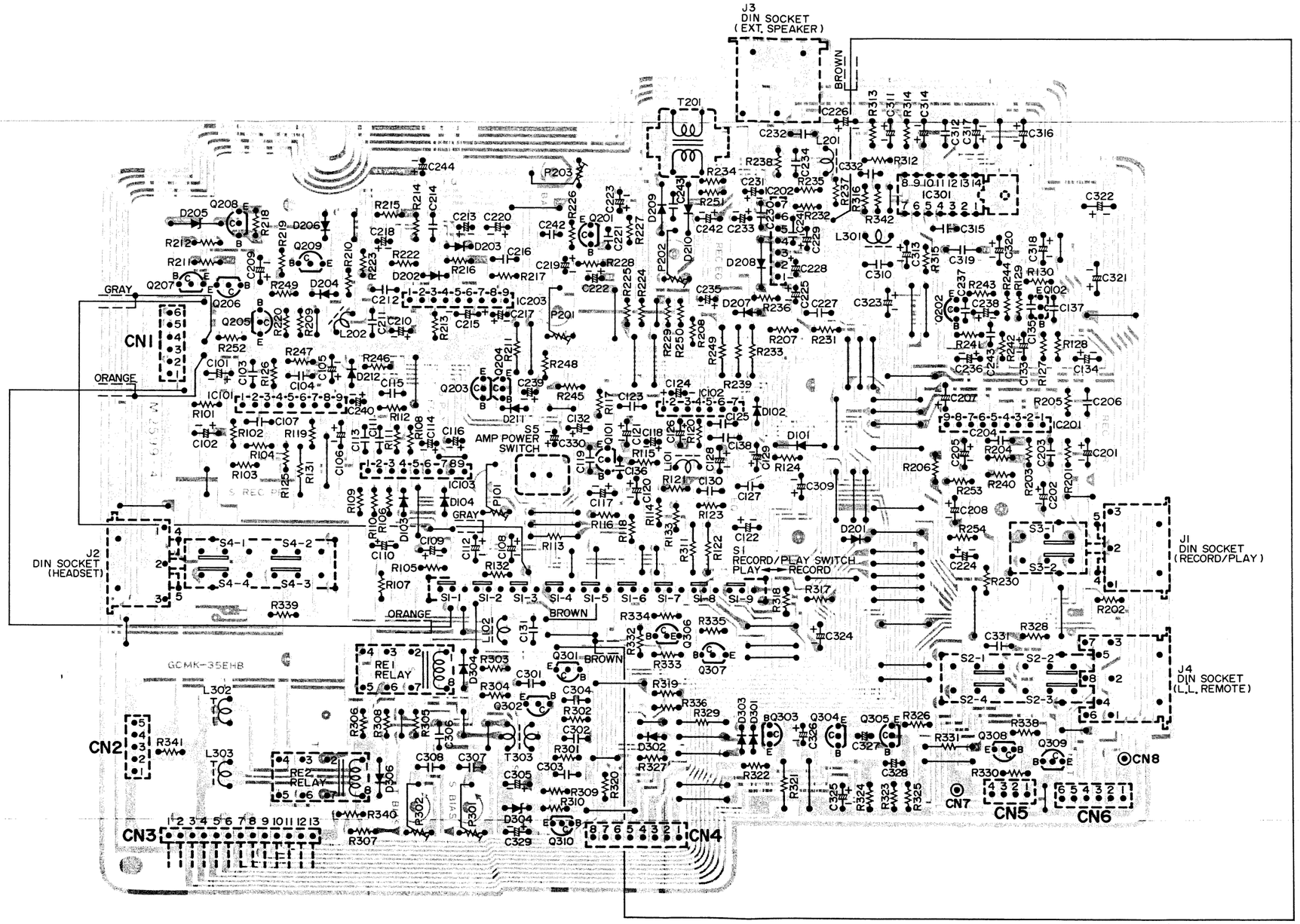
STUDENT/TEACHER VOLUME P.C.BOARD



WIRING DIAGRAM

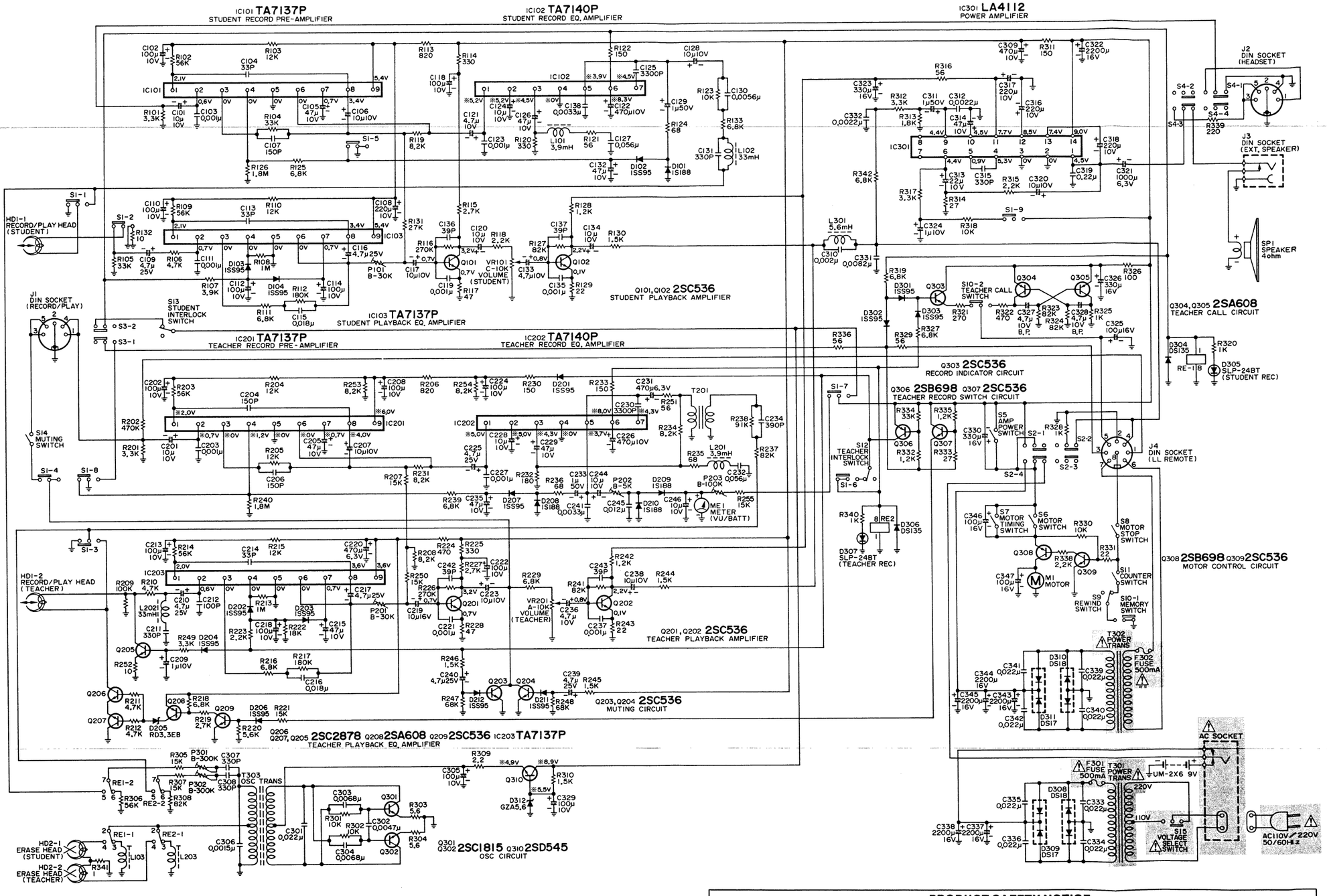


AMPLIFIER P.C.BOARD



No.	Name	Position	No.	Name	Position
S1	Record/Play Switch	PLAY	S9	REWIND Switch	OFF
S2	L.L. Remote DIN Switch	OFF	S10-1	Memory Switch	OFF
S3	Record/Play DIN Switch	OFF	S10-2	Teacher Call Switch	OFF
S4	Headset DIN Switch	OFF	S11	Counter Switch	OFF
S5	AMP Power Switch	OFF	S12	Teacher Interlock Switch	OFF
S6	Motor Switch	OFF	S13	Stident Interlock Switch	OFF
S7	Motor Timing Switch	LIMIT	S14	Muting Switch	OFF
S8	Motor Stop Switch	OFF	S15	Voltage Select Switch	220V

SCHEMATIC DIAGRAM



PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A COMPONENT REPLACEMENT IS MADE IN ANY AREA OF AN UNIT. COMPONENTS INDICATED BY A MARK ⚠ IN THIS SCHEMATIC DIAGRAM SHOW COMPONENTS WHOSE VALUE HAS SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS SPECIFIED ON THE ATTACHED PARTS LIST BE USED FOR COMPONENT REPLACEMENT POINTED OUT BY THE MARK.